

XLIV. *On the Sectional Characters of the Genus Lucanus, with Descriptions of some new Species of Lucanidæ.* By J. O. WESTWOOD, F.L.S., &c.

[Read 5th February, 1844, and 3rd March, 1845.]

IN reviewing the distributions which have been proposed by Entomologists, for the more natural or more convenient arrangement of extensive groups of insects, we repeatedly find certain characters employed which, looking at higher results in connexion with the economy and existence of the creatures before us, it requires but very little acquaintance with the insect world to perceive can by no possibility have the slightest influence; in other words, that they are entirely unimportant as connected with insect life and which we thence term artificial characters.

The employment of such characters is, it is true, absolutely requisite for furthering the ends of science, although this is much to be regretted, because, as must have happened in the experience of every Entomologist, we are constantly exposed to the ridicule of others, ignorant of the science and of the nature of those artificial characters, when they find us occupied in counting the joints in the antenna of a beetle or carefully tracing the intricacies of the veining of the wings of a fly. What, ask they, can be the possible use of wasting your time and talents on such frivolous pursuits as these? What can possibly be gained by knowing whether this beetle has five joints in its hind tarsus or only four? What possibly can be learned by finding out that there are three or only two short transverse veins between the subcostal and radial veins of the wing of a sand wasp?

Now nothing, in the whole course of an examination of extensive tribes of insects, is more remarkable than the pertinacity (if we may be so bold as to employ such a term) with which these trivial characters are maintained throughout such groups. It may, indeed, appear a trivial question, whether a beetle possesses more than eleven joints in its antennæ, but when we know that at least ninety-nine out of every hundred species of beetles possess exactly eleven joints in the antennæ, we at once arrive at the conclusion that a departure from this typical number as it is termed must be attended with some circumstances not without interest if we could but determine them. So again it may at first sight seem very immaterial whether this species of sand wasp possesses three or only two transverse veins forming the sub-

marginal cells, but when it is known that the character of the species is as distinctly impressed, not only on the precise number but absolutely on the precise points of insertion of these veins as it is on the highest points of its economy or outward structure, we equally at once arrive at the same conclusion that a knowledge of this character, artificial as it may be, is from the mere simplicity of its employment, a character as valuable as though it were derived from its most important organs. There is, in fact, so singular an uniformity maintained in these comparatively unimportant characters, that the examination of them becomes as strong an evidence of the marvellous power of the Creator as the most elaborately constructed portion of their frames; in fact, we oftener find deviations from the typical structure of higher parts than from these trivial ones. To find a *Carabus* with only four joints in its tarsus would in fact be as great an anomaly and a much greater rarity than to find one with monstrously furcate antennæ. It is on these grounds that the employment of these comparatively trivial characters is justifiable and indeed absolutely necessary, and it is especially on this account that the employment of the characters to be derived from the veining of the wings in *Hymenoptera*, *Diptera*, *Lepidoptera*, &c., has been so much and so long insisted upon.

These remarks have been suggested by a recent examination of an extensive group of beetles with the view of determining their species. To do this effectually it was requisite to examine the whole group with much attention so as to determine the relative value of the various sectional characters which the different species exhibited, or, in other words, to learn whether by grouping the species from the possession or want of certain structural peculiarities we should not run the risk of separating more widely apart than was evidently warranted by nature, species which possessed an evident affinity between themselves resulting from their possessing other characters in common.

The group in question was the genus *Lucanus*, possessing nearly 150 species in the whole; and from an examination of at least 120 species I was led to the conclusion that the number of small spines upon the outer edge of the middle and posterior tibiæ constituted the most available artificial character for grouping those species together which evidently possessed the greatest natural relationship with each other. The employment of this character had been partially adopted by the Rev. F. W. Hope, in his isolated descriptions of some of the species, published in the Linnæan Transactions and elsewhere, but it had not hitherto been applied to the



*Phytoc. Oregonensis*



9



4

*L. reticulatus*  
*m. 2nd*



2

*L. can. Roffensis*  
*juv.*



3

*L. sordidus*  
*juv.*



7

*L. malabaricus*



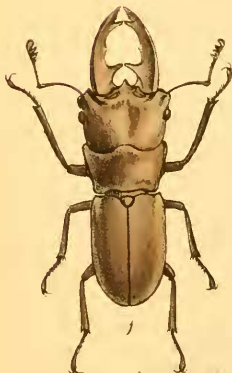
8

*L. can. distinctus*  
*juv.*



6

*L. can. cognatus*  
*juv.*



1

*L. can. fuscicornis*  
*juv.*



5

*L. can. capitatus*  
*juv.*

whole genus, nor had it ever been conjectured that in some species the differences exhibited by these spines afforded sexual characteristics, although the extensive employment of the character amongst the *Cetoniidæ* and Goliath beetles had shown it to possess both sectional and sexual distinctions.

The number of joints in the club of the antennæ at first suggested itself, and indeed it had been already proposed by MacLeay, as a primary sectional character; but this, in addition to the difficulty in its employment, owing to the greater or less development of the joint preceding the clava, was shown to be inefficient, by separating species which agreed together in their entire habitus. Its employment also was found to be opposed by the number of these tibial spines, which brought together in the most natural manner the great majority of the species.

By the employment of this character the genus *Lucanus* is divisible into three great groups: first, those with two or three spines on the outside of the posterior and intermediate tibiæ, amongst which are most of the largest species in the family, including our well-known stag beetle, which may in fact be considered as the type of the family; second, those with only one spine in the middle of the four posterior tibiæ in both sexes, in which section are brought together the gigantic species of *Dorcus* from the East, the small typical *Dorci* of moderate climes, and the group which Mr. MacLeay has called *Ægus*, but of which no Entomologist has ever been able to lay down characters sufficient to separate it from various other sections of *Lucanidæ*; third, an extensive group of species, being nearly the half of the whole genus, which either possess no spines to the four posterior tibiæ, or have one small one developed in the middle of these tibiæ in the females alone; of the species which belong to the first of these two subsections with simple tibiæ, *Lucanus metallifer* of Boisduval, *L. Burmeisteri*, Hope, Ent. Trans.; *L. bicolor*, F.; *Delcasserti*, Guérin; *Saundersii*, Hope (*bicolor*, Saunders); *Baladeva*, Hope; *glabratus*, De Haan, &c., may be mentioned; whilst of those which have the tibiæ of the males simple and those of the females 1-spined, may be cited *L. Downesii*, Hope, Z. Tr.; *L. cinnamomeus*, Guérin; *L. dorsalis*, Erichs., which is probably the female of *L. cavifrons*, Burm. MS., and a considerable number of new species from the East and Africa contained in Mr. Hope's Collection.

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Sp. 1. *Lucanus faunicolor*, Hope. (Pl. XX. fig. 1.)

*L. mandibulis magnis porrectis, dente valido ante alteroque*

pone medium apicibusque serratis, totus supra luteo-fusco-pulverosus, antennis longis, tibiisque inermibus ♂.

Long. corp., cum mandib. ♂, unc.  $1\frac{1}{2}$ .

Habitat in Oriente. Insula Java?

In Mus. D. Buquet, Parisiis.

An varietas *L. metallici*, Boisduv.?

Caput magnum subquadratum, disco fere plano, margine antico deflexo, et in nasum conicum parum elevatum porrectum, angulis anticis lateralibus ante oculos oblique truncatis. Oculi rotundati, cantho antice vix incisi. Mandibulæ capite longiores, dente valido interno ante, alteroque (oblique truncato) pone medium, apicibus intus serratis. Antennæ longæ, articulo 1mo curvato, 7mo intus attenuatim producto et setoso. Pronotum capite angustius, lateribus in medio angulato-deflexis. Elytra pronoto haud latiora. Totum corpus supra nigrum, virescente tinctum at omnino squamis luteis vel faunicoloribus tectum, margine externo elytrorum obscure nigricanti. Pedes longi, graciles, tibiis simplicibus, anticis spina rudimentali in medio externe instructis. Tarsi articulis basalibus subtus fulvo-setosis. Prosternum simplex.

Sp. 2. *Lucanus Rafflesii*, Hope. (Pl. XX. fig. 2.)

*L. castaneo-rufus*, nitidus; mandibulis, scutello, et sutura elytrorum nigris; capite et pronoto lateribus punctatis.

Long. corp. ♀, unc. 1.

Habitat in Insula Java?

In Mus. Dom. Guérin, Parisiis.

Caput pronoto duplo minus, punctatum, angulis lateralibus anticis oblique truncatis. Mandibulæ breves, nigrae, nitidae, costatae. Pronotum lateribus rotundatis et punctatis, elytrorum fere latitudine æquans, disco lævi nitido. Elytra nitida subdepressa, sutura et scutello nigricantibus. Totum corpus supra castaneo-rufum. Pedes concolores, tibiæ anticae 6-dentatae, 4 posticae in medio externe 1-dentatae. Oculi cantho subdivisi.

Sp. 3. *Lucanus sericeus*, Hope. (Pl. XX. fig. 3.)

*L. niger*, lateribus late piceo-castaneis, luteo-sericeis, mandibulis brevibus, tibiis anticis extus serratis et 3-dentatis, pronoto in medio angulato.

Long. corp. unc.  $\frac{5}{6}$ .

Habitat in Insula Java.

In Mus. Dom. Guérin, Parisiis.

Caput mediocre, angulis anticis lateralibus oblique sub-truncatis. Mandibulæ breves, nigræ. Caput nigrum, rude punctatum, lateribus piceo-castaneis. Oculi cantho parum incisi. Antennæ articulo 7mo intus parum producto setaque armato. Pronotum capite latius, lateribus in medio angulato-productis, dorso nigro, punctato, lateribus piceo-castaneis, fulvo-pilosis. Elytra minutè punctatissima, pronoti latitudine, obscure piceo-castanea, tenue fulvo-pilosa, sutura obscura. Tibiæ anticæ extus serrulatæ, dentibusque tribus validioribus apicem versus armatæ. Tibiæ 4 posticæ in medio extus dente unico armatæ.

Sp. 4. *Lucanus reticulatus*, Buquet, MS. (Pl. XX. fig. 4.)

L. mandibulis brevibus crassis, intus obtuse dentatis, subdepressus, niger, pronoto subquadrato elytrisque squamoso-reticulatis.

Long. corp. lin. 6.

Habitat in Nova Zeelandia.

In Mus. D. Buquet, Parisiis.

Caput parvum, nigrum, nitidum, margine antico depresso. Mandibulæ breves, obtusæ, dentibusque duobus obtusis armatis. Antennæ articulo 7mo vix intus producto setoso. Oculi cantho subdivisi. Mentum transversum, angulis anticis rotundatis, margine antico in medio parum emarginato. Pronotum subquadratum, capite multo latius, lateribus parum rotundatis, disco spatiis nonnullis luteo-squamosis. Elytra pronoti latitudine obscure luteo-squamosa, spatiis vel interstitiis glabris reticulata. Pedes breves, nigri. Tibiæ anticæ extus 5-6-dentatæ, 4 posticæ in medio dente unico armatæ.

Sp. 5. *Lucanus (Dorcus) capitatus*, Westw.\* (Pl. XX. fig. 5.)

Niger, tenuissime punctatus, capite et pronoto latissimis, mandibulis capite longioribus, apice falcatis, intus ante medium dente valido suberecto obtuso instructis, pedibus et elytris piceis, his 6-striatis.

Long. corp. (mandibulis exclusis) lin. 16 ; lat. capitis lin. 7½.

Habitat Malacca.

In Mus. D. Guérin, Parisiis.

Caput magnum, latissimum, disco fere plano, tenuissime punctatum ; utrinque, pone basin mandibularum, tuberculo conico elevato instructum. Mandibulæ capite longiores, sat tenues,

\* *L. platycephalus*, Guérin, MSS., but not *L. platycephalus*, Hope, in Trans. Ent. Soc. vol. iv. p. 73.